

Green Proving Ground

Wireless Sensors for Data Centers



Kevin Powell | May 23 2012 | FEMP Technology Deployment Working Group

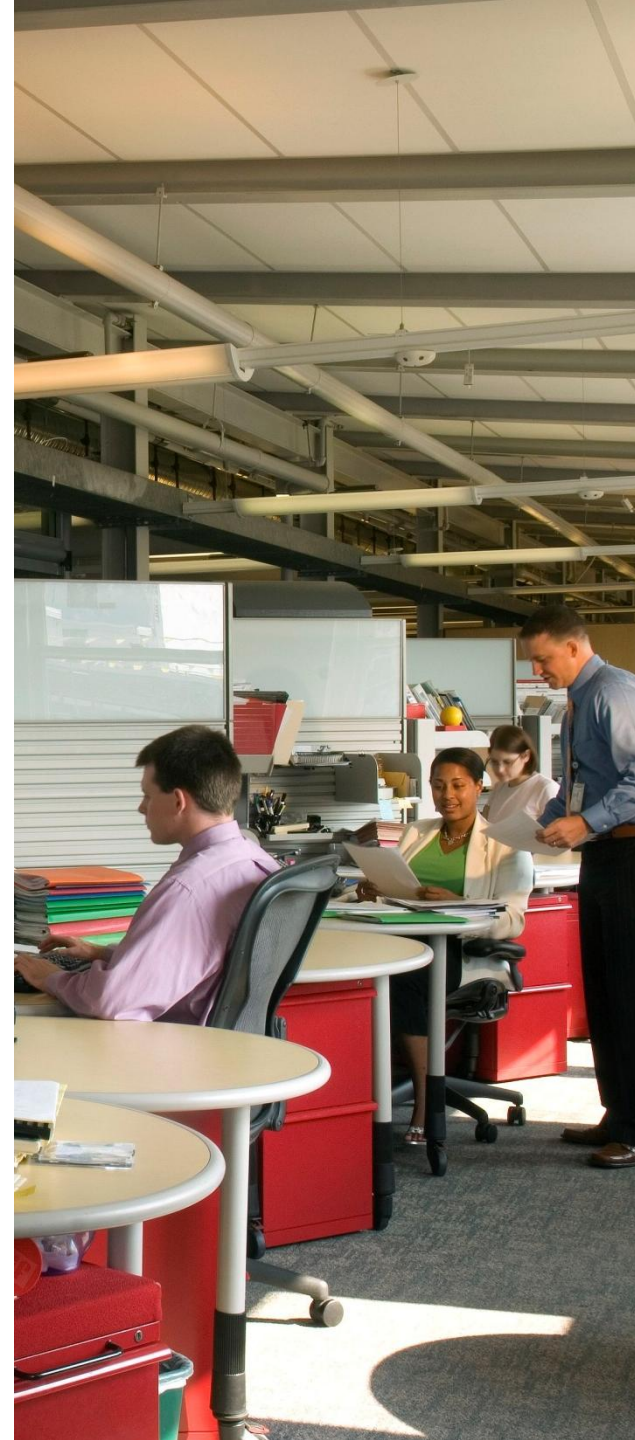
9,624 Owned and Leased Assets

EISA
2007 30%

Metered Energy Reduction, by 2015

NET
ZERO

In New Construction and Major
Remodels, by 2030



GSA's Green Proving Ground



The Green Proving Ground aims to leverage innovative technologies to accelerate GSA's sustainability goals.

Program Focus: Identify, test and evaluate innovative technologies to:

- Drive innovation in environmental performance in federal buildings
- Help lead market transformation through deployment of new technologies.
- Reduce GSA operational costs

How Does It Work?

Green Proving Ground

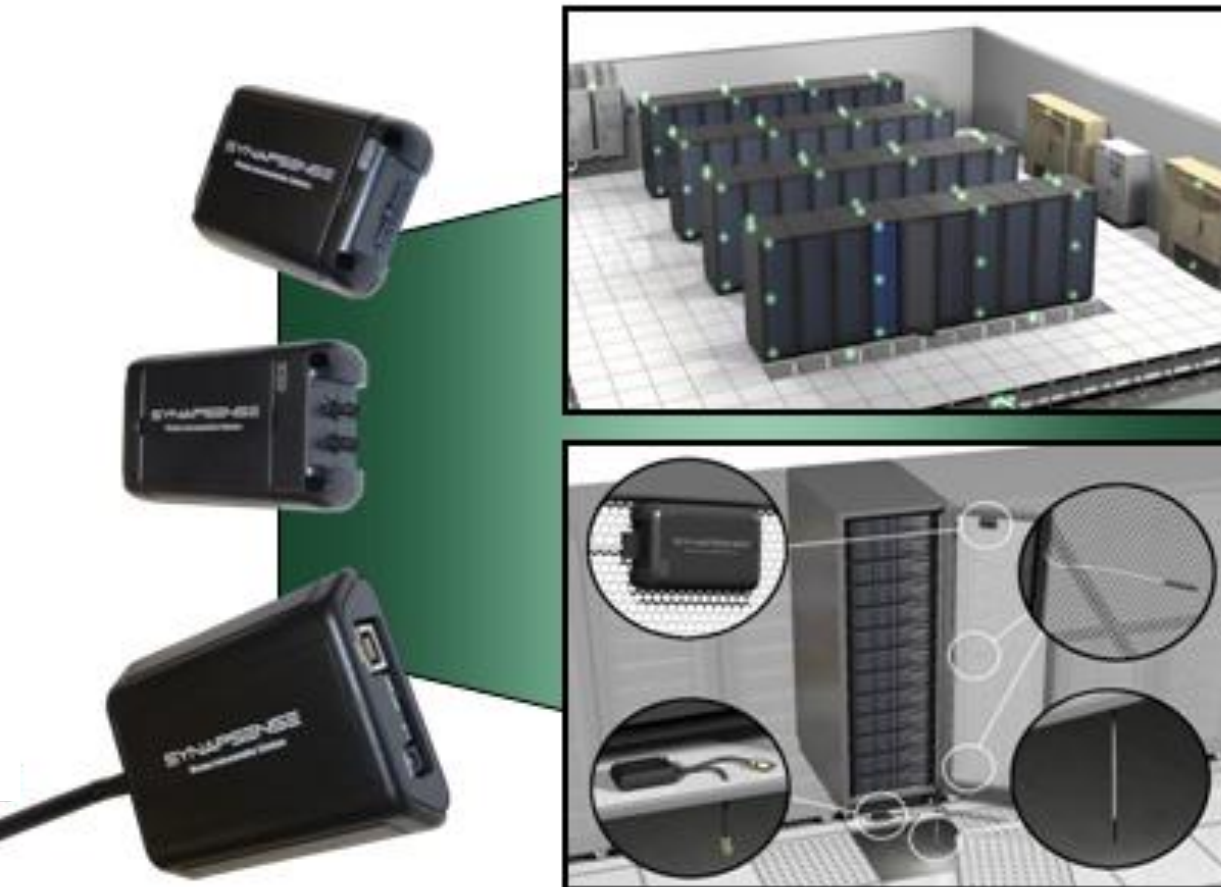
Evaluate effectiveness of technologies and practices in a building operations environment

- Metering
- Occupant satisfaction
- Building operations
- Economic return
- Broader application potential



Wireless Mesh Sensor Network Technology

Cost effectively monitor multiple points throughout a data center



Temperature
Humidity
Pressure
Leak Detection
CW BTU
Power
Dry Contact
Equipment Status
Particle Count



3.5 Years for simple payback

48%

Reduction in facility cooling load

End user assessment: an effective tool



“By most standards, this data center is an efficient facility. The fact that a wireless sensor network helped it significantly reduce its energy profile speaks volumes for the technology.”

Ron Jones
Facility Manager
Office of the Chief Information Officer

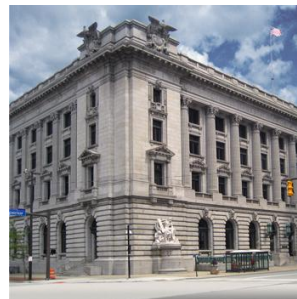
Applied across GSA Portfolio

\$32.4

Million saved annually

345,000

Metric tons reduction in carbon emissions



FY 2011 Green Proving Ground

M&V Results



Spring 2012:

- Wireless Mesh Sensor Network

Summer 2012:

- Portfolio Assessment - PV
- Smart Windows
- Plug Load Reduction
- Occupant Responsive Lighting

Fall 2012:

- Non-Chemical Water Treatment
- PV w/Solar Water Heating
- Magnetic Bearing Compressor
- Variable-Speed Chiller Plant Control
- Condensing Boilers

Winter 2012:

- High R Value Windows
- Commercial GSHP
- Integrated Daylighting Systems
- Chilled Beam
- Variable Refrigerant Flow



FINDINGS, MARCH 2012

WIRELESS SENSOR NETWORKS



Wireless Sensors Help Decrease Data Center Energy Consumption

Data centers consume roughly two percent of all energy used in the United States, and their carbon footprint is projected to exceed that of the airline industry by 2020¹. Nearly 50 percent of data center energy typically goes to non-IT loads, such as cooling and power conditioning. In the federal sector, agencies currently lease space from GSA to operate more than 1400 data centers². In an effort to help client agencies increase energy efficiency in building operations, GSA's Green Proving Ground (GPG) program recently assessed the potential of wireless sensor technology to provide a cost-effective and facilities-friendly way of helping data center operators visualize and implement system changes that reduce overall energy consumption. Findings include significant cost savings, as well as a substantial reduction in cooling load and CO₂ emissions.



The Green Proving Ground program leverages GSA's real estate portfolio to evaluate innovative sustainable building technologies. The program aims to drive innovation in environmental performance in federal buildings and help lead market transformation through deployment of new technologies.

For program information on the Green Proving Ground: gsa.gov/gpg

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